

# Modern Concepts of Cardiovascular Disease

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DR. SAMUEL A. LEVINE, Boston, Editor

DR. MARSHALL N. FULTON, Boston, Associate Editor

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## DISEASES OF THE VEINS

Only the commonest diseases — varicose veins and thrombophlebitis—will be considered here.

The *Cause of Varix*, or *Varicose Veins*, lies in the unprotected situation of the superficial veins. All veins of the legs must conduct blood against gravity and often against a raised abdominal pressure. All are so supplied with valves that muscular compression (aided by capillary pressure) empties them toward the heart. The deep veins among the muscles are so well supported and protected that they are not subject to varicosity. Outside the muscular sheath, the veins are liable to dilatation, and once their valvular mechanism is broken down, they become tortuous and fibrosed. In the upright position, blood pours down them and is carried through communicating veins to the competent deep vessels which must manage this extra load. Therefore, obliteration or removal of varicose veins always lessens the work of the deep vessels, never increases it.

The *Symptoms* of varix are very variable: a feeling of heaviness on much standing, sometimes itching and a little edema of the ankle. Varicose veins are most obvious below the knee, but even if invisible in the thigh, are always palpable and readily traced by the shock transmitted up the tense vein on sharply tapping it below in the calf. The appearance of pigmented areas upon the lower leg is a sign of malnutrition and a threat of ulcer.

*Diagnosis* depends upon the appearance or palpability of dilated veins and particularly upon Trendelenberg's test. This consists in elevating the leg above the body and then lowering it as the patient stands. Blood can be seen and felt to pour down the varicose veins. There are also tests of the competency of the communicating veins but no test of the deep veins is needed. If they too were varicose, blood could not rise in the dependent leg and the foot would turn black. Such a state, however, is unknown.

The *complications of Varix* are (1) Ulcer, (2) Thrombophlebitis, (3) Rupture and (4) Eczema. An Ulcer is apt to ride upon a varicose vein, commonly on the inner face of the lower calf or at the

ankle. A blow or scratch starts it; infection extends it. Bandaging, to compress the causal veins, is at first curative. Recurrence is the rule. Only after years does the sore become deep and indurated. Before this time, it is curable by obliteration or removal of the varicose veins. *Thrombophlebitis* usually begins just below the knee and frequently mounts to the saphenous opening. The thrombosed vein is palpable; the skin over it is often reddened. Actually, suppuration almost never occurs though the degree of fever and the activity of the local perivenous inflammation would seem to threaten this result. Thus, local drainage is rarely required. Resolution or canalization is slow, even with rest, and the vein is never obliterated. Embolism is very rare, the clot being well fixed. Recurrence is so much the rule that a varicose vein, once thrombosed, may properly be removed. Rest in bed is far from curative. The application of ice neither prevents extension nor promotes healing. The application of a fixed adhesive bandage (Elastoplast type) permits the individual to go about as usual with apparently no increased risk of embolism and with a prospect of a rapid (two to three weeks) cure. *Rupture*, from a dilated, sacculated area, rarely occurs. Elevation and pressure quickly control bleeding and healing is rapid. The accident is likely to be repeated. *Eczema*, about the ankles of those elsewhere subject to it, is often precipitated by varix and is usually relieved by its cure.

*Treatment of Varicose Veins and Ulcer.* Semi-elastic bandages or well fitted elastic stockings relieve the symptoms of varix and cause ulcer, in its early stages, to heal. Elastic (rubber sponge) pressure over the ulcer area is of decided aid. Injections of sclerosing substances (20 per cent saline, 50 per cent glucose, quinine and urethane, sodium morrhuate and others) temporarily obliterate varices, especially if they are not too large, and without other treatment than local applications, cure ulcer. Recurrences, however, are so much the rule that high division (at the saphenous opening) plus injection is far more desirable and may be offered to patients of any age. Excision gives the most

## SCIENTIFIC SESSION

The program of the Eleventh Scientific Meeting of the American Heart Association, to be held in Atlantic City on June 11, 1935, will be composed of selected topics dealing with Heart Disease. Members desiring to submit titles of communications are urged to write to Dr. E. Cowles Andrus, 1201 North Calvert St., Baltimore, Maryland, prior to February tenth. A brief abstract of the paper should be included.

radical cure, but should not be used for those of over 55 years (danger of embolism). It is the only reasonable treatment for varix complicated by incompetent communicating veins (outflow from normal deep veins into the varices). Ulcers not relieved by injection and high division, or by excision of varix, may properly be excised and skin grafted.

#### *Thrombophlebitis*

The thrombophlebitis of varicose veins has already been described. It is a local disease, causes no swelling of the leg, rarely gives rise to embolism and is decidedly recurrent. It bears little resemblance to other forms of thrombophlebitis.

*Phlegmasia Alba Dolens*, or deep iliac and femoral phlebitis, is usually a complication of a debilitating disease, an injury or an abdominal operation and is especially common in the puerperium. The thrombosis always occupies the external and sometimes the common iliac vein, even extending into the vena cava. Generally it is solid and fixed, but occasionally a thrombus breaks off and causes pulmonary embolism. Thrombosis extends down the femoral vein and into its tributaries for a variable distance and there is usually an inflammatory reaction about the great vessels of the pelvis and thigh, causing local tenderness. The onset is apt to be preceded by a rise of pulse and temperature. Pain is often present and is referred to the groin, inner face of the thigh or back of the knee. It may be so severe as to suggest arterial ischemia or be absent altogether. During the 24 to 48 hours following the first symptoms, swelling begins, mounts from ankle to groin and within a few days sometimes becomes so tense as not to pit on pressure. The swollen leg is white, heavy, often painful to move.

The *Acute Stage*, in the mildest cases, only lasts ten days or so, and the swelling is gone in less than three weeks, leaving little trouble behind. But in the worst sort, the leg remains tense for months, fever is continuous and in all the more serious cases, whether or not some residual edema is left, there are apt to appear, six months to ten years later, upon any part of the lower leg or about the ankles, local areas of obstinate induration, pigmentation and, eventually, ulceration. Though these have often been attributed to varicose veins (compensatory, enlarged superficial veins are sometimes left after a deep thrombophlebitis) actually they are in no way related to them. Venous obstruction does not persist. The thrombosed vein is recanalized, apparently leaving little venous stasis. Such collateral circulation as is formed is usually most noticeable in the region of the groin and lower abdominal wall.

*Treatment*, during the acute stage, consists in elevation of the leg well above the body's level, to free the tissues of fluid and so ward off future sclerosis. Immobilization is not essential, for it does not protect against the unusual complication of embolism. Applications of ice are useless, heat being preferable. As soon as fever has subsided, active motion should be begun, at first in elevation. The leg must be accustomed, gradually, to a dependent

position. It should be exercised, never left passively dependent. Bandaging is useful.

*Deep Peripheral Thrombosis*, among the muscles of the calf (or thigh) is rare and causes no such general edema as is the rule with phlegmasia alba dolens. It shows itself only in local swelling and moderate cyanosis at the ankle, that is, when the leg is in use. On elevation, all signs disappear, the main vessels being pervious. The symptoms vacillate even over a period of months. The thrombosis is insecurely fixed and embolism is a constant danger. If early, full immobilization does not relieve the condition, division of the femoral vein distal to the saphenous opening, protects against embolism and is curative.

*Phlebitis Migrans* is a rare form of localized phlebitis in the superficial veins—a complication of thrombo-angiitis obliterans as a rule. A short length of vessel is involved at any one time. Characteristically, an inch or two of a vein becomes firm and tender. After ten days or so, resolution occurs and a new area appears, usually higher on the same limb. In this way, a whole extremity may be traversed. Heat is beneficial. Embolism is little to be feared.

*Septic Forms of Phlebitis* include such varieties as Pyelephlebitis and Sinus Thrombosis.

*Pyelephlebitis*, that is, a septic thrombosis of portal veins, is a rare complication of acute suppurative appendicitis, and leads, if the patient survives long enough, to hepatic abscess. It is marked by continued fever and deterioration, unaccounted for by the state of the operative field. The early treatment of appendicitis is most likely to forestall the establishment of this dangerous, usually fatal, disease.

Several of the cerebral venous sinuses may become filled with a septic clot, notably the cavernous sinus, from infection of the upper lip and face, and the lateral sinus, from acute mastoiditis. Cavernous sinus thrombosis is fatal, but the lateral sinus can be approached through the mastoid and the general circulation protected by ligation of the internal jugular vein.

*Metabolic Factors in Thrombosis*. Though varicosity, local infection and local trauma appear to explain much thrombophlebitis, other factors causing blood to clot in the veins may be even more significant. Following surgical, especially abdominal, operations (less often fractures) thrombosis and pulmonary embolism are serious complications. With debilitating illnesses, phlegmasia alba dolens is frequently associated. In all such states, dehydration and slowing of the blood stream play an important, even fundamental, part. There may, in addition, be dietary influences. Present day feeling, therefore, is that in connection with surgical operations and such serious diseases as cause prolonged confinement to bed, maintenance of the water balance and the circulatory vigor should lessen the incidence of venous thrombosis and embolism.

JOHN HOMANS, M.D.,  
Boston, Mass.

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